

CLAIMS

What is claimed is:

- 5 1. A process for the crystallization of an adipic acid-containing oxidation product produced by the nitric acid oxidation of cyclohexanone (K) and cyclohexanol (A), said oxidation product comprising adipic acid, glutaric acid and nitric acid, said process comprising,
- introducing into a first crystallizer said oxidation product, said
10 crystallizer providing a first crystallization temperature sufficient to produce a first crystallizer product comprising a first mother liquor and a first harvest of solid crystals, said solid crystals being present at a concentration of at least about 10 weight percent based on the combined weight of the mother liquor and the crystals;
- 15 introducing the first crystallizer product into a second crystallizer providing a second crystallizer temperature lower than said first temperature to produce a second crystallizer product comprising a second mother liquor and a second harvest of solid crystals, said second mother liquor having a lower concentration of adipic acid than said first mother
20 liquor and said second harvest of solid crystals having a greater weight percent of adipic acid than said first harvest; and
- either
- harvesting the solid crystals from the second crystallizer if the concentration of adipic acid in solution in the second mother liquor is
25 less than or equal to a pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the second mother liquor, or, if the concentration of adipic acid in solution in the second mother liquor is higher than said pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the second mother liquor, then
- 30 introducing the second crystallizer product into one additional crystallizer or a plurality of additional crystallizers in series providing successively lower crystallization temperatures until a final crystallization product comprising a final mother liquor and a final harvest of solid crystals is produced in which the concentration of adipic acid in

solution in the final mother liquor is less than or equal to said pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the final mother liquor, and

5 harvesting the solid crystals from the final crystallization product.

2. The process of claim 1 further comprising

- (a) withdrawing at least a portion of the first crystallizer product from the first crystallizer,
- 10 (b) combining at least a portion of the adipic acid-containing oxidation product and the first crystallizer product from step (a) to produce a first premixed feed slurry, and
- (c) feeding the first premixed feed slurry to the first crystallizer.

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3. The process of claim 1 further comprising

- (a) withdrawing at least a portion of the second crystallizer product from the second crystallizer,
- (b) combining at least a portion of the adipic acid-containing oxidation product and the crystallizer product from step
- 20 (a) to produce a second premixed feed slurry, and
- (c) feeding the second premixed feed slurry to the second crystallizer.